

REMARKS

Rejection of claims 1-25 is maintained under 35 U.S.C. § 102(b) over Patrick et al., U.S. Patent No. 5,706,843 (hereinafter "Patrick"). By this amendment, independent claims 1, 11 and 21 are amended. As amended, independent claim 1 calls for a method including performing a first pixel transformation at a first virtual memory location *in a virtual memory space, using a one-way re-mapping* to write the transformed pixel data from the first virtual memory location to the virtual memory address of the second memory location, and transferring the pixel data to a memory controller using a memory controller client, *in a forward, write-through direction*. Support may be found in the Applicant's specification on pages 4:21-25, 5:9-25 and 6:11-21.

However, the Patrick reference fails to teach or disclose the transformation of pixel data from a first to a second memory location in a virtual memory space before transferring the pixel data to a memory controller using a memory controller client. Use of a one-way re-mapping with a write-through for performing own pixel transformation operation and address translation at a virtual memory location is absent in the Patrick reference. Instead, Patrick, in the process of transferring a data block from a source to a destination in memory, involves passing as parameters the location of the source and destination while each byte in the data block must be fetched (i.e., read) from a source address and written to a destination address. See column 5, lines 14-20 and column 6, lines 27-31.

Thus, transferring a data block from a source to a destination in memory, involves fetching or reading data from the source address before writing to the destination address. This precludes a one-way transformation and manipulation of pixel data by writing the pixel data from one virtual memory location to another virtual memory location before transferring the pixel data in a forward, write-through direction, as now claimed in claim 1. Rather, the Patrick reference teaches writing data to a memory location after reading from a different memory location. Accordingly, the Patrick reference fails identically to disclose the claimed invention and, therefore, does not anticipate. In particular, this reference fails to teach and/or disclose one-way re-mapping based transformation and manipulation of pixel data in a virtual memory space,

as claimed in claim 1. Nowhere does the Patrick reference teach or disclose use of virtual memory space for pixel transformations and address translation, resulting in a forward, write-through video/graphics operation.

In a conventional graphics/video engine architecture of the type commonly seen in mainstream PC systems, such as described in the Patrick reference, transformations like color space conversion and scaling on pixels are performed in an “active” fashion. Pixels are first generated and deposited into memory as the result of some drawing operation (e.g., 3D or video-based rendering). To impose additional operations, like color space conversion or scaling, those pixels are then typically fetched from memory by an explicit memory “fetch” engine, the operation is imposed, and the pixels are written back to memory. The imposition of the transformation is “actively” applied because it requires an explicit fetch engine to be set up with the parameters of the operation.

In contrast, the invention claimed in claim 1 enables the passive application of imaging and video functions like color space conversion and scaling through the mapping of these functions into virtual memory space. An application writes pixels to a range of virtual memory addresses, a “passive” engine imposes the chosen operation, a new “re-mapped” memory address is generated, and the pixels are written to the new memory location. Any of a large number of operations (including scaling, color conversion, composition, etc.) can be implemented into this architecture.

Therefore, as amended, independent claim 1 and the claims dependent therefrom are in condition for allowance. Amended independent claim 11 calls for an article claim that corresponds to claim 1. For at least the reasons indicated above, claim 11 and the claims dependent therefrom cannot be anticipated by the Patrick reference.

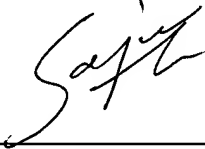
With respect to claim 21, which is directed to a system including a memory controller that receives pixel data and virtual memory addresses for a one-way transformation of the pixel data in a virtual memory space, a first memory controller client forwards pixel data and addresses to a first transfer function, and a second memory controller client receives data from the first transfer function together with the new virtual memory addresses for transfer in a

forward, write-through direction. There is not a remote hint whatsoever provided in the Patrick reference as to using two separate memory controller clients, as claimed in claim 21, for a one-way transformation in a virtual memory space.

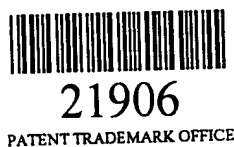
Use of two separate memory controller clients, one forwarding pixel data and virtual memory addresses to a first transfer function and the second receiving the pixel data from the transfer function together with new virtual memory addresses to transfer the pixel data in a forward, write-through direction is absent from the Patrick reference. In this manner, the Applicant respectfully submits that the amended independent claim 21 and the claims dependent therefrom are also patentably distinguishable over the Patrick reference since the cited reference fails to teach or suggest the Applicant's claimed invention therein. The Examiner is respectfully requested to reconsider the pending claims.

In view of these remarks and amendments, the application is now in condition for allowance and the Examiner's prompt action in accordance therewith is respectfully requested.

Respectfully submitted,



Date: April 15, 2003



Sanjeev K. Singh under 37 C.F.R. § 10.9(b)
Registration No. 28,994
TROP, PRUNER & HU, P.C.
8554 Katy Freeway, Suite 100
Houston, Texas 77024
(713) 468-8880 [Phone]
(713) 468-8883 [Fax]